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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,495	04/20/2006	Shunpei Yamazaki	740756-2954	3721

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EXAMINER
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WON, BUMSUK

ART UNIT	PAPER NUMBER
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2889

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04/30/2010

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/576,495	<b>Applicant(s)</b> YAMAZAKI ET AL.	
	<b>Examiner</b> BUMSUK WON	<b>Art Unit</b> 2889	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-47 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/16/2010, 2/16/2010</u> .                                    | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

The amendment filed on 2/16/2010 has been entered.

### ***Response to Arguments***

Applicant's arguments filed on 2/16/2010 have been fully considered but they are not persuasive. Regarding claims 1-47, the applicant argues that the rejection under 35 USC 103 is improper because the present invention does not relate to an improvement of the adhesion of a photocatalyst layer, but, instead, on the enhancement of the adhesion of a layer formed on the photocatalyst layer. The examiner respectfully agrees that the purpose of having photocatalyst layer in the instant application may be different from the applied prior arts of record, Yamazaki (US 2002/0104995) and Tabuchi (US 2003/0059717). However, the fact that applicant has recognized another advantage which would flow naturally from following the suggestion of the prior art cannot be the basis for patentability when the differences would otherwise be obvious. See *Ex parte Obiaya*, 227 USPQ 58, 60 (Bd. Pat. App. & Inter. 1985).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5-7, 9 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki (US 2002/0104995) in view of Tabuchi (US 2003/0059717).

Regarding claim 1, Yamazaki discloses a display device (figure 2) comprising: a substrate (not referenced) on which a layer (not referenced) is formed; a first transistor (101) including a first gate

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electrode (114), the first transistor being formed over the layer; a second transistor (102) including a second gate electrode (115) which is connected to a first drain electrode (111) of the first transistor, the second transistor being formed over the layer; an insulating film (117) provided so as to cover the first and the second transistors; a first electrode (122), which is connected to a second drain electrode (112) of the second transistor; an electroluminescent layer (123) formed over the first electrode; and a second electrode (124), which is provided over the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer.

Tabuchi discloses a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the layer of Yamazaki with the photocatalyst layer of Tabuchi, for the purpose of improving strength and adhesion of the photocatalyst layer.

Regarding claim 5, the examiner notes that the claim limitation of the first and the second gate electrodes is formed over an area treated with base pretreatment is drawn to a process of manufacturing which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (MPEP 2113). Also, Yamazaki in view of Tabuchi discloses the first and second gate electrodes being formed over an area treated with base treatment (here, the examiner interprets the photocatalyst layer of Tabuchi as being treated with base treatment). The reason for combining is same as claim 1.

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Regarding claim 6, Tabuchi discloses the pretreatment is performed by using photocatalyst (paragraph 124). The reason for combining is same as claim 1.

Regarding claim 7, Yamazaki discloses the gate electrodes and the drain electrodes contains tungsten (paragraph 83).

Regarding claim 9, Yamazaki discloses the transistors include an amorphous semiconductor (paragraph 77).

Regarding claim 11, the examiner notes "a television receiver" is a recitation of the intended use of the claimed invention which must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, it meets the claim. Here, the claim merely recites "a television receiver" without any structural specificity.

Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Tabuchi, in further view of Arai (US 2004/0160167).

Regarding claim 2, Yamazaki discloses a display device (figure 2) comprising: a substrate (not referenced) on which a layer (not referenced) is formed; a first transistor (101) including a first gate electrode (114), the first transistor being formed over the layer; a second transistor (102) including a second gate electrode (115) which is connected to a first drain electrode (111) of the first transistor, the second transistor being formed over the layer; an insulating film (117) provided so as to cover the first and the second transistors; a first electrode (122), which is connected to a second drain electrode (112) of the second transistor; an electroluminescent layer (123) formed over the first electrode; and a second electrode (124), which is provided over the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer.

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Tabuchi discloses a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the layer of Yamazaki with the photocatalyst layer of Tabuchi, for the purpose of improving strength and adhesion of the photocatalyst layer.

Yamazaki in view of Tabuchi does not specifically disclose the first gate electrode has convex curved face.

Arai discloses a display device (figure 1) having a gate electrode (105) which has a convex curved face (paragraph 31), for the purpose of enhancing contactability and facilitation in selective processing.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the shape of the gate electrode as Arai in the device disclosed by Yamazaki in view of Tabuchi, for the purpose of enhancing contactability and facilitation in selective processing.

Regarding claim 8, the examiner notes that the claim limitation of ink-jet is used for the droplet discharge method is drawn to a process of manufacturing which is incidental to the claimed apparatus. It is well established that a claimed apparatus cannot be distinguished over the prior art by a process limitation. Consequently, absent a showing of an unobvious difference between the claimed product and the prior art, the subject product-by-process claim limitation is not afforded patentable weight (MPEP 2113).

Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Tabuchi and Arai, in further view of Kobayashi (US 2003/0168966).

Regarding claim 3, Yamazaki discloses a display device (figure 2) comprising: a first transistor (101) including a first gate electrode (114); a second transistor (102) including a second gate electrode

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(115) which is connected to a first drain electrode (111) of the first transistor; a first insulating film (117) provided so as to cover the first and the second transistors; a second insulating film (125) covering the first insulating film; a first electrode (122) of an electroluminescent layer (123), which is connected to a second drain electrode (112) of the second transistor; and a second electrode (124) of the electroluminescent layer, which is provided over the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer.

Tabuchi discloses a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the layer of Yamazaki with the photocatalyst layer of Tabuchi, for the purpose of improving strength and adhesion of the photocatalyst layer.

Yamazaki in view of Tabuchi does not specifically disclose the first gate electrode has convex curved face.

Arai discloses a display device (figure 1) having a gate electrode (105) which has a convex curved face (paragraph 31), for the purpose of enhancing contactability and facilitation in selective processing.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the shape of the gate electrode as Arai in the device disclosed by Yamazaki in view of Tabuchi, for the purpose of enhancing contactability and facilitation in selective processing.

Yamazaki in view of Tabuchi and Arai does not specifically disclose a second insulating film containing nitrogen.

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Kobayashi discloses a display device having an insulating film containing nitrogen (paragraph 65), for the purpose of effectively insulating between conductors.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have an insulating film containing nitrogen as disclosed by Kobayashi in the device disclosed by Yamazaki in view of Tabuchi and Arai, for the purpose of effectively insulating between conductors.

Regarding claim 4, Yamazaki discloses a display device (figure 2) comprising: a first transistor (101) including a first gate electrode (114); a second transistor (102) including a second gate electrode (115) which is connected to a first drain electrode (111) of the first transistor; a first insulating film (117) provided so as to cover the first and the second transistors; a second insulating film (125) covering the first insulating film; a first electrode (122) of an electroluminescent layer (123), which is connected to a second drain electrode (112) of the second transistor; and a second electrode (124) of the electroluminescent layer, which is provided over the electroluminescent layer (123), wherein the cathode, an electron injection layer, an electron transport layer, a light emitting layer, a hole transport layer, and a hole injection layer are stacked in order in the electroluminescent layer (paragraph 198).

Yamazaki does not specifically disclose the layer is a photocatalyst layer.

Tabuchi discloses a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the layer of Yamazaki with the photocatalyst layer of Tabuchi, for the purpose of improving strength and adhesion of the photocatalyst layer.



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Yamazaki in view of Tabuchi does not specifically disclose the first gate electrode has convex curved face.

Arai discloses a display device (figure 1) having a gate electrode (105) which has a convex curved face (paragraph 31), for the purpose of enhancing contactability and facilitation in selective processing.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the shape of the gate electrode as Arai in the device disclosed by Yamazaki in view of Tabuchi, for the purpose of enhancing contactability and facilitation in selective processing.

Yamazaki in view of Tabuchi and Arai does not specifically disclose a second insulating film containing nitrogen.

Kobayashi discloses a display device having an insulating film containing nitrogen (paragraph 65), for the purpose of effectively insulating between conductors.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have an insulating film containing nitrogen as disclosed by Kobayashi in the device disclosed by Yamazaki in view of Tabuchi and Arai, for the purpose of effectively insulating between conductors.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Tabuchi, in further view of Suh (US 2005/0088106).

Regarding claim 10, Yamazaki in view of Tabuchi does not specifically disclose a protective circuit is provided for the scan line and the signal line.

Suh discloses a display device having a protective circuit is provided for the scan line and the signal line (paragraphs 35-36), for the purpose enhancing robustness and reliability of the display device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a protective circuit provided for the scan line and the signal line as disclosed by Suh in

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the device disclosed by Yamazaki in view of Tabuchi, for the purpose enhancing robustness and reliability of the display device.

Claims 12-17, 43 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Tabuchi, in further view of Nakamura (US 2004/0216324).

Regarding claim 12, Yamazaki discloses a method for fabricating a display device (figure 2), comprising the steps of: forming a layer (not referenced) as a base film over a substrate (not referenced); forming a first conductive film (110-113) by applying a composition containing a conductor; forming a semiconductor film (116) over the first conductive film; forming second conductive films (114, 115) over the semiconductor film by applying a composition containing a conductor, whereby a thin film transistor (101, 102) is formed; forming a first insulating film (117) so as to cover the thin film transistor; forming a first electrode (122) over the first insulating film; forming a second insulating film (125) so as to cover an end portion of the first electrode; forming an electroluminescent layer (123) over the first electrode; and forming a second electrode (124) so as to cover the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer.

Tabuchi discloses a method for fabricating a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the layer of Yamazaki with the photocatalyst layer of Tabuchi, for the purpose of improving strength and adhesion of the photocatalyst layer.

Yamazaki in view of Tabuchi does not specifically disclose the first conductive film and the second conductive films are formed by applying first and second liquid composition.

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Nakamura discloses a method for fabricating a display device (paragraph 19) including forming conductive films by applying liquid compositions (paragraph 19), for the purpose of enhancing productivity of the device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use liquid compositions for conductive films as disclosed by Nakamura in the method disclosed by Yamazaki in view of Tabuchi, for the purpose of enhancing productivity of the device.

Regarding claim 13, Yamazaki discloses a method for fabricating a display device (figure 2), comprising the steps of: forming a layer (not referenced) as a base film over a substrate (not referenced); forming a first conductive film (110-113) by applying a composition containing a conductor; forming a semiconductor film (116) over the first conductive film; forming second conductive films (114, 115) over the semiconductor film by applying a composition containing a conductor, whereby a thin film transistor (101, 102) is formed; forming a first insulating film (117) so as to cover the thin film transistor; forming a first electrode (122) over the first insulating film; forming a second insulating film (125) so as to cover an end portion of the first electrode; forming an electroluminescent layer (123) in an opening provided for the second insulating film; and forming a second electrode (124) so as to cover the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer.

Tabuchi discloses a method for fabricating a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the layer of Yamazaki with the photocatalyst layer of Tabuchi, for the purpose of improving strength and adhesion of the photocatalyst layer.

Yamazaki in view of Tabuchi does not specifically disclose the conductive films being formed by a droplet discharge method.

Nakamura discloses a method for fabricating a display device (paragraph 19) including forming conductive films by droplet discharge method (paragraph 19), for the purpose of enhancing productivity of the device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form conductive films by droplet discharge method as disclosed by Nakamura in the method disclosed by Yamazaki in view of Tabuchi, for the purpose of enhancing productivity of the device.

Regarding claim 14, Tabuchi discloses a step of pretreating (here, the examiner interprets the photocatalyst layer 1-3 is a step of pretreating) where the first conductive film is formed. The reason for combining is same as claim 12.

Regarding claim 15, Tabuchi discloses a step of pretreating (here, the examiner interprets the photocatalyst layer 1-3 is a step of pretreating) where the second conductive film is formed. The reason for combining is same as claim 12.

Regarding claim 16, Tabuchi discloses the pretreatment is performed by using photocatalyst (paragraph 124).

Regarding claim 17, Tabuchi discloses the pretreatment is performed by using photocatalyst (paragraph 124).

Regarding claims 43 and 47, Nakamura discloses the droplet discharge method (paragraph 19).

The reason for combining is same as claim 13.

Claims 18-22 and 25-41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Tabuchi, Nakamura and Kiguchi (US 2003/0210361).

Regarding claim 18, Yamazaki discloses a method for fabricating a display device (figure 2), comprising the steps of: forming a layer (not referenced) as a base film over a substrate (not referenced); forming a first conductive film (110-113) by applying a composition containing a conductor; forming a semiconductor film (116) over the first conductive film; forming second conductive films (114, 115) over the semiconductor film by applying a composition containing a conductor, whereby a thin film transistor (101, 102) is formed; forming a first insulating film (117) so as to cover the thin film transistor; forming a first electrode (122) over the first insulating film; forming a second insulating film (125) so as to cover an end portion of the first electrode; forming an electroluminescent layer (123) over the first electrode; and forming a second electrode (124) so as to cover the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer, the conductive films being formed by a droplet discharge method, and forming masks over the semiconductor film; patterning the semiconductor film using the masks; forming a first and a second source electrodes and a first and a second drain electrodes over the patterned semiconductor films by a droplet discharge method.

Tabuchi discloses a method for fabricating a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

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Nakamura discloses a method for fabricating a display device (paragraph 19) including forming conductive films by droplet discharge method (paragraph 19), for the purpose of enhancing productivity of the device.

Kiguchi discloses a method for fabricating a display device including using masking method and etching method to form patterns (paragraph 38), for the purpose of effectively patterning layers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have photocatalyst layer as disclosed by Tabuchi, a droplet discharge method disclosed in Nakamura, and using masking method and etching method to form patterns as disclosed by Kiguchi in the method disclosed by Yamazaki, for the purpose of enhancing manufacturability.

Regarding claims 19 and 20, Yamazaki discloses a method for fabricating a display device (figure 2), comprising the steps of: forming a layer (not referenced) as a base film over a substrate (not referenced); forming a first conductive film (110-113) by applying a composition containing a conductor; forming a semiconductor film (116) over the first conductive film; forming second conductive films (114, 115) over the semiconductor film by applying a composition containing a conductor, whereby a thin film transistor (101, 102) is formed; forming a first insulating film (117) so as to cover the thin film transistor; forming a first electrode (122) over the first insulating film; forming a second insulating film (125) so as to cover an end portion of the first electrode; forming an electroluminescent layer (123) over the first electrode; and forming a second electrode (124) so as to cover the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer, the conductive films being formed by a droplet discharge method, and forming masks over the semiconductor film; patterning the semiconductor film using the masks; forming a first and a second source electrodes and a first and a second drain electrodes over the patterned semiconductor films by a droplet discharge method.

Tabuchi discloses a method for fabricating a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Nakamura discloses a method for fabricating a display device (paragraph 19) including forming conductive films by droplet discharge method (paragraph 19), for the purpose of enhancing productivity of the device.

Kiguchi discloses a method for fabricating a display device including using masking method and etching method to form patterns (paragraph 38), for the purpose of effectively patterning layers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have photocatalyst layer as disclosed by Tabuchi, a droplet discharge method disclosed in Nakamura, and using masking method and etching method to form patterns as disclosed by Kiguchi in the method disclosed by Yamazaki, for the purpose of enhancing manufacturability.

Regarding claim 21, Yamazaki discloses a method for fabricating a display device (figure 2), comprising the steps of: forming a layer (not referenced) as a base film over a substrate (not referenced); forming a first conductive film (110-113) by applying a composition containing a conductor; forming a semiconductor film (116) over the first conductive film; forming second conductive films (114, 115) over the semiconductor film by applying a composition containing a conductor, whereby a thin film transistor (101, 102) is formed; forming a first insulating film (117) so as to cover the thin film transistor; forming a first electrode (122) over the first insulating film; forming a second insulating film (125) so as to cover an end portion of the first electrode; forming an electroluminescent layer (123) over the first electrode; and forming a second electrode (124) so as to cover the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer, the conductive films being formed by a droplet discharge method, and forming masks over the semiconductor film; patterning the semiconductor film using the masks; forming a first and a second source electrodes and a first and a second drain electrodes over the patterned semiconductor films by a droplet discharge method.

Tabuchi discloses a method for fabricating a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Nakamura discloses a method for fabricating a display device (paragraph 19) including forming conductive films by droplet discharge method (paragraph 19), for the purpose of enhancing productivity of the device.

Kiguchi discloses a method for fabricating a display device including using masking method and etching method to form patterns (paragraph 38), for the purpose of effectively patterning layers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have photocatalyst layer as disclosed by Tabuchi, a droplet discharge method disclosed in Nakamura, and using masking method and etching method to form patterns as disclosed by Kiguchi in the method disclosed by Yamazaki, for the purpose of enhancing manufacturability.

Regarding claim 22, Yamazaki discloses a method for fabricating a display device (figure 2), comprising the steps of: forming a layer (not referenced) as a base film over a substrate (not referenced); forming a first conductive film (110-113) by applying a composition containing a conductor; forming a semiconductor film (116) over the first conductive film; forming second conductive films (114, 115) over the semiconductor film by applying a composition containing a conductor, whereby a thin film transistor (101, 102) is formed; forming a first insulating film (117) so as to cover the thin film transistor; forming a first



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electrode (122) over the first insulating film; forming a second insulating film (125) so as to cover an end portion of the first electrode; forming an electroluminescent layer (123) over the first electrode; and forming a second electrode (124) so as to cover the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer, the conductive films being formed by a droplet discharge method, and forming masks over the semiconductor film; patterning the semiconductor film using the masks; forming a first and a second source electrodes and a first and a second drain electrodes over the patterned semiconductor films by a droplet discharge method.

Tabuchi discloses a method for fabricating a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Nakamura discloses a method for fabricating a display device (paragraph 19) including forming conductive films by droplet discharge method (paragraph 19), for the purpose of enhancing productivity of the device.

Kiguchi discloses a method for fabricating a display device including using masking method and etching method to form patterns (paragraph 38), for the purpose of effectively patterning layers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have photocatalyst layer as disclosed by Tabuchi, a droplet discharge method disclosed in Nakamura, and using masking method and etching method to form patterns as disclosed by Kiguchi in the method disclosed by Yamazaki, for the purpose of enhancing manufacturability.

Regarding claim 25, Yamazaki discloses a method for fabricating a display device (figure 2), comprising the steps of: forming a layer (not referenced) as a base film over a substrate (not referenced); forming a first conductive film (110-113) by applying a composition containing a conductor; forming a

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semiconductor film (116) over the first conductive film; forming second conductive films (114, 115) over the semiconductor film by applying a composition containing a conductor, whereby a thin film transistor (101, 102) is formed; forming a first insulating film (117) so as to cover the thin film transistor; forming a first electrode (122) over the first insulating film; forming a second insulating film (125) so as to cover an end portion of the first electrode; forming an electroluminescent layer (123) over the first electrode; and forming a second electrode (124) so as to cover the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer, the conductive films being formed by a droplet discharge method, and forming masks over the semiconductor film; patterning the semiconductor film using the masks; forming a first and a second source electrodes and a first and a second drain electrodes over the patterned semiconductor films by a droplet discharge method.

Tabuchi discloses a method for fabricating a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Nakamura discloses a method for fabricating a display device (paragraph 19) including forming conductive films by droplet discharge method (paragraph 19), for the purpose of enhancing productivity of the device.

Kiguchi discloses a method for fabricating a display device including using masking method and etching method to form patterns (paragraph 38), for the purpose of effectively patterning layers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have photocatalyst layer as disclosed by Tabuchi, a droplet discharge method disclosed in Nakamura, and using masking method and etching method to form patterns as disclosed by Kiguchi in the method disclosed by Yamazaki, for the purpose of enhancing manufacturability.

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Regarding claim 26, Tabuchi discloses a step of pretreating (here, the examiner interprets the photocatalyst layer 1-3 is a step of pretreating) where the first conductive film is formed. The reason for combining is same as claim 25.

Regarding claim 27, Tabuchi discloses a step of pretreating (here, the examiner interprets the photocatalyst layer 1-3 is a step of pretreating) where the second conductive film is formed. The reason for combining is same as claim 25.

Regarding claim 28, Tabuchi discloses the pretreatment is performed by using photocatalyst (paragraph 124). The reason for combining is same as claim 25.

Regarding claim 29, Tabuchi discloses the pretreatment is performed by using photocatalyst (paragraph 124). The reason for combining is same as claim 25.

Regarding claim 30, Yamazaki discloses channel protective films (133) are formed in contact with the semiconductor film (116) over the first and the second gate electrode (114 and 115).

Regarding claim 31, Yamazaki discloses a method for fabricating a display device (figure 2), comprising the steps of: forming a layer (not referenced) as a base film over a substrate (not referenced); forming a first conductive film (110-113) by applying a composition containing a conductor; forming a semiconductor film (116) over the first conductive film; forming second conductive films (114, 115) over the semiconductor film by applying a composition containing a conductor, whereby a thin film transistor (101, 102) is formed; forming a first insulating film (117) so as to cover the thin film transistor; forming a first electrode (122) over the first insulating film; forming a second insulating film (125) so as to cover an end portion of the first electrode; forming an electroluminescent layer (123) over the first electrode; and forming a second electrode (124) so as to cover the electroluminescent layer (123).

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Yamazaki does not specifically disclose the layer is a photocatalyst layer, the conductive films being formed by a droplet discharge method, and forming masks over the semiconductor film; patterning the semiconductor film using the masks; forming a first and a second source electrodes and a first and a second drain electrodes over the patterned semiconductor films by a droplet discharge method.

Tabuchi discloses a method for fabricating a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Nakamura discloses a method for fabricating a display device (paragraph 19) including forming conductive films by droplet discharge method (paragraph 19), for the purpose of enhancing productivity of the device.

Kiguchi discloses a method for fabricating a display device including using masking method and etching method to form patterns (paragraph 38), for the purpose of effectively patterning layers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have photocatalyst layer as disclosed by Tabuchi, a droplet discharge method disclosed in Nakamura, and using masking method and etching method to form patterns as disclosed by Kiguchi in the method disclosed by Yamazaki, for the purpose of enhancing manufacturability.

Regarding claim 32, Tabuchi discloses a step of pretreating (here, the examiner interprets the photocatalyst layer 1-3 is a step of pretreating) where the first conductive film is formed. The reason for combining is same as claim 31.

Regarding claim 33, Tabuchi discloses a step of pretreating (here, the examiner interprets the photocatalyst layer 1-3 is a step of pretreating) where the second conductive film is formed. The reason for combining is same as claim 31.

Regarding claim 34, Tabuchi discloses the pretreatment is performed by using photocatalyst (paragraph 124). The reason for combining is same as claim 31.

Regarding claim 35, Tabuchi discloses the pretreatment is performed by using photocatalyst (paragraph 124). The reason for combining is same as claim 31.

Regarding claim 36, Yamazaki discloses a method for fabricating a display device (figure 2), comprising the steps of: forming a layer (not referenced) as a base film over a substrate (not referenced); forming a first conductive film (110-113) by applying a composition containing a conductor; forming a semiconductor film (116) over the first conductive film; forming second conductive films (114, 115) over the semiconductor film by applying a composition containing a conductor, whereby a thin film transistor (101, 102) is formed; forming a first insulating film (117) so as to cover the thin film transistor; forming a first electrode (122) over the first insulating film; forming a second insulating film (125) so as to cover an end portion of the first electrode; forming an electroluminescent layer (123) over the first electrode; and forming a second electrode (124) so as to cover the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer, the conductive films being formed by a droplet discharge method, and forming masks over the semiconductor film; patterning the semiconductor film using the masks; forming a first and a second source electrodes and a first and a second drain electrodes over the patterned semiconductor films by a droplet discharge method.

Tabuchi discloses a method for fabricating a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

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Nakamura discloses a method for fabricating a display device (paragraph 19) including forming conductive films by droplet discharge method (paragraph 19), for the purpose of enhancing productivity of the device.

Kiguchi discloses a method for fabricating a display device including using masking method and etching method to form patterns (paragraph 38), for the purpose of effectively patterning layers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have photocatalyst layer as disclosed by Tabuchi, a droplet discharge method disclosed in Nakamura, and using masking method and etching method to form patterns as disclosed by Kiguchi in the method disclosed by Yamazaki, for the purpose of enhancing manufacturability.

Regarding claim 37, Yamazaki discloses a method for fabricating a display device (figure 2), comprising the steps of: forming a layer (not referenced) as a base film over a substrate (not referenced); forming a first conductive film (110-113) by applying a composition containing a conductor; forming a semiconductor film (116) over the first conductive film; forming second conductive films (114, 115) over the semiconductor film by applying a composition containing a conductor, whereby a thin film transistor (101, 102) is formed; forming a first insulating film (117) so as to cover the thin film transistor; forming a first electrode (122) over the first insulating film; forming a second insulating film (125) so as to cover an end portion of the first electrode; forming an electroluminescent layer (123) over the first electrode; and forming a second electrode (124) so as to cover the electroluminescent layer (123).

Yamazaki does not specifically disclose the layer is a photocatalyst layer, the conductive films being formed by a droplet discharge method, and forming masks over the semiconductor film; patterning the semiconductor film using the masks; forming a first and a second source electrodes and a first and a second drain electrodes over the patterned semiconductor films by a droplet discharge method.

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Tabuchi discloses a method for fabricating a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Nakamura discloses a method for fabricating a display device (paragraph 19) including forming conductive films by droplet discharge method (paragraph 19), for the purpose of enhancing productivity of the device.

Kiguchi discloses a method for fabricating a display device including using masking method and etching method to form patterns (paragraph 38), for the purpose of effectively patterning layers.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have photocatalyst layer as disclosed by Tabuchi, a droplet discharge method disclosed in Nakamura, and using masking method and etching method to form patterns as disclosed by Kiguchi in the method disclosed by Yamazaki, for the purpose of enhancing manufacturability.

Regarding claim 38, Tabuchi discloses a step of pretreating (here, the examiner interprets the photocatalyst layer 1-3 is a step of pretreating) where the first conductive film is formed. The reason for combining is same as claim 37.

Regarding claim 39, Tabuchi discloses a step of pretreating (here, the examiner interprets the photocatalyst layer 1-3 is a step of pretreating) where the second conductive film is formed. The reason for combining is same as claim 37.

Regarding claim 40, Tabuchi discloses the pretreatment is performed by using photocatalyst (paragraph 124). The reason for combining is same as claim 37.

Regarding claim 41, Tabuchi discloses the pretreatment is performed by using photocatalyst (paragraph 124). The reason for combining is same as claim 37.

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Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Tabuchi, Nakamura and Kiguchi, in further view of Natsuo (JP 2001-281438) which is cited in the IDS.

Regarding claim 23, Yamazaki in view of Tabuchi, Nakamura and Kiguchi does not specifically disclose the first insulating film is repellent to the columnar organic film.

Natsuo discloses a method for fabricating a device including an insulating film is repellent to the organic film (paragraphs 39 and 54), for the purpose of effectively forming organic film layer in the device.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have an insulating film is repellent to the organic film as disclosed by Natsuo in the method disclosed by Yamazaki in view of Tabuchi, Nakamura and Kiguchi, for the purpose of effectively forming organic film layer in the device.

Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Tabuchi, Nakamura and Kiguchi, in further view of Lee (US 2003/0165714).

Regarding claim 24, Yamazaki in view of Tabuchi, Nakamura and Kiguchi does not specifically disclose the columnar organic film is removed by water washing.

Lee discloses a method for fabricating a device including removing organic film by water (paragraph 45), for the purpose of reducing manufacturing process and cost.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have removing organic film by water as disclosed by Lee in the method disclosed by Yamazaki in view of Tabuchi, Nakamura and Kiguchi, for the purpose of reducing manufacturing process and cost.

Claim 42 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Tabuchi and Nakamura, in further view of Akedo (US 2001/0044259).



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Regarding claim 42, Yamazaki in view of Tabuchi and Nakamura does not specifically disclose a surface of the first insulating film is planarized by spraying a gas.

Akedo discloses a method for fabricating a device including a step of planarization by spraying gas (claim 6), for the purpose of reducing cost of process as well as enhancing planarization of the layer.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a step of planarization by spraying gas as disclosed by Akedo in the method disclosed by Yamazaki in view of Tabuchi and Nakamura, for the purpose of reducing cost of process as well as enhancing planarization of the layer.

Claims 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki in view of Tabuchi and Nakamura, in further view of Akedo (US 2001/0044259).

Regarding claim 44, Yamazaki discloses a method for fabricating a display device including steps of: forming a conductive film (110-113) and an insulating film (117) over an object (100).

Yamazaki does not specifically disclose preparing a treatment system includes droplet discharge and planarization by a means for spraying a gas.

Tabuchi discloses a method for fabricating a device (figures 4 and 5) having a substrate (1-1) with a photocatalyst layer (1-3) on the substrate, for the purpose of improving strength and adhesion of the photocatalyst layer (paragraph 124).

Nakamura discloses a method for fabricating a display device including a droplet discharge method (paragraph 19), for the purpose of enhancing manufacturability.

Akedo discloses a method for fabricating a device including a step of planarization by spraying gas (claim 6), for the purpose of reducing cost of process as well as enhancing planarization of the layer.

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Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have a photocatalyst layer to treat the substrate as disclosed by Tabuchi, a drop discharge method as disclosed by Nakamura, and a step of planarization by spraying gas as disclosed by Akedo in the method disclosed by Yamazaki, for the purpose of reducing cost of process as well as enhancing planarization of the layer.

Regarding claim 45, Tabuchi discloses a step of pretreating (here, the examiner interprets the photocatalyst layer 1-3 is a step of pretreating) where the second conductive film is formed. The reason for combining is same as claim 44.

Regarding claim 46, Tabuchi discloses the pretreatment is performed by using photocatalyst (paragraph 124). The reason for combining is same as claim 44.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Contact information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to BUMSUK WON whose telephone number is (571)272-2713. The examiner can normally be reached on Monday through Friday, 8:00 am to 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minh Toan Ton can be reached on 571-272-2303. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Bumsuk Won/  
Primary Examiner, Art Unit 2889